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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,148	04/13/2004	Chrong Jung Lin	252016-2330	4545

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EXAMINER

SOWARD, IDA M

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/823,148

Applicant(s)

LIN ET AL.

Examiner

Ida M. Soward

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29-32 is/are allowed.
- 6) ☒ Claim(s) 19-24, 27 and 28 is/are rejected.
- 7) ☒ Claim(s) 25 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5-19-04.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the preliminary amendment filed April 13, 2004.

Priority

It is noted that this application appears to claim subject matter disclosed in prior Application No. 10/295,157, filed 11/15/2002. A reference to the prior application must be inserted as the first sentence(s) of the specification of this application or in an application data sheet (37 CFR 1.76), if applicant intends to rely on the filing date of the prior application under 35 U.S.C. 119(e), 120, 121, or 365(c). See 37 CFR 1.78(a). For benefit claims under 35 U.S.C. 120, 121, or 365(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of all nonprovisional applications. If the application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference to the prior application must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen

months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A benefit claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed benefit claim under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

If the reference to the prior application was previously submitted within the time period set forth in 37 CFR 1.78(a), but not in the first sentence(s) of the specification or an application data sheet (ADS) as required by 37 CFR 1.78(a) (e.g., if the reference was submitted in an oath or declaration or the application transmittal letter), and the information concerning the benefit claim was recognized by the Office as shown by its inclusion on the first filing receipt, the petition under 37 CFR 1.78(a) and the surcharge under 37 CFR 1.17(t) are not required. Applicant is still required to submit the reference

in compliance with 37 CFR 1.78(a) by filing an amendment to the first sentence(s) of the specification or an ADS. See MPEP § 201.11.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear what is meant to be claimed... thickness or 600 to 1100 °C.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 19-20, 22-24 and 27-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Vora (US 6,897,520 B2).

In regard to claim 19, Vora teaches a multi-level, multi-bit stacked gate flash

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memory cell structure comprising: floating gate spacers 22 & 22' having convex walls facing each other, and vertical outside walls; conformal dielectric layer 24 covering said convex walls of said floating gate spacers 22 & 22'; a control gate 28 therebetween said convex walls of said floating gate spacers 22 & 22' with intervening said conformal dielectric layer 24; and insulative spacers 20 & 20' formed on said vertical outside walls of said floating gates 22 & 22' (Figure 5, columns 2-4, lines 28-67, 1-67 and 1-37, respectively).

In regard to claim 20, Vora teaches said floating gate spacers 22 & 22' comprising polysilicon having a lateral thickness of 1000 Å, which is between about 500 to 2000 Å (Figure 5, column 11, lines 62-65).

In regard to claim 22, Vora teaches the control gate 28 comprising polysilicon (Figure 5, column 4, lines 34-37).

In regard to claim 23, Vora teaches the oxide spacers having a lateral thickness of 3000 Å, which is in the range of 1000 to 3000 Å (column 12, line 41).

In regard to claim 24, Vora teaches A multi-level, multi-bit stacked gate flash memory cell structure, comprising: two floating gates 22 & 22' on an insulating layer 18 on a substrate 10, having opposite sidewalls facing each other; a conformal dielectric layer 24 covering opposite sidewalls of the two floating gates 22 & 22'; a control gate 28 therebetween the opposite sidewalls of the two floating gates 22 & 22' with intervening the conformal dielectric layer 24; and two insulative spacers 20 & 20' covering outside walls of the two floating gates 22 & 22' (Figure 5, columns 2-4, lines 28-67, 1-67 and 1-37, respectively).

In regard to claim 27, Vora teaches the floating gates 22 & 22' and control gate 28 comprising polysilicon (Figure 5, columns 2 and 4, lines 40-49 and 26-37, respectively).

In regard to claim 28, Vora teaches the conformal dielectric layer 24 comprising oxide-nitride-oxide (ONO) (Figure 5, column 2, line 48).

Allowable Subject Matter

Claims 29-32 are allowed.

Claims 25-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not disclose, make obvious, or otherwise suggest the structure of the applicant's together with the other limitations of the independent claims, such as first, second and third doped regions in the substrate as source/drain regions, wherein the first doped region disposed between the two opposite sidewalls of the two floating gates, and the second and third doped regions are disposed outside of the outside walls of the two floating gates respectively.

The dependent claims being further limiting and definite are also allowable.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to multi-level, multi-bit stacked gate flash memory cells:

Forbes et al. (US 6,778,441 B2)	Hofmann et al. (US 6,639,269 B1)
Hong (5,429,970)	Keshtbod (5,479,368)
Lin (US 6,562,673 B2)	Sekariapuram et al. (6,091,102)
Yang (6,093,945).	

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ida M. Soward whose telephone number is 571-272-1845. The examiner can normally be reached on Monday - Thursday 6:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

IMS

September 6, 2005

John M. Samard
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